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United States Department of Agriculture

BUREAU OF AGRICULTURAL ECONOMICS

SERVICE AND REGULATORY ANNOUNCEMENTS NO. 154¹

UNITED STATES STANDARDS FOR APPLES

UNITED STATES DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C.

By virtue of the authority vested in the Secretary of Agriculture by the provision in the act of Congress entitled "An Act Making Appropriations for the Department of Agriculture and for the Farm Credit Administration for the fiscal year ending June 30, 1938, and for other purposes", approved June 29, 1937 (50 Stat. 395), or any future act of Congress conferring like authority, for the demonstration and promotion of the use of uniform standards of classification of American farm products throughout the world, I, H. A. Wallace, Secretary of Agriculture, do make and promulgate the following standards for apples, effective on and after September 1, 1937, unless amended or superseded by standards hereafter prescribed and promulgated under such authority.

UNITED STATES STANDARDS FOR APPLES

INTRODUCTION

Numbers and letters in parentheses following grade terms indicate where such terms are defined on pages 3 to 5 under Definitions of Terms.

When the numerical count is marked on the container, percentages shall be calculated on the basis of count.

When the minimum diameter or minimum and maximum diameters are marked on the container, percentages shall be calculated on the basis of weight.

When the apples are in bulk, percentages shall be calculated on the basis of weight.

GRADE REQUIREMENTS

U. S. Fancy shall consist of apples of one variety which are mature (1) but not overripe (2), carefully hand-picked (3), clean (4), fairly well formed (5); free from decay, internal browning, internal break-down, scald, freezing injury, broken skins and bruises (except those incident to proper handling and packing), and visible water core. The apples shall also be free from damage (7) caused by russetting (7a), sunburn (7b), spray burn (7b), limb rubs (7c), hail (7d), drought spot (7d), scars (7d), disease (7e), insects (7f), or mechanical or other means (7). Each apple of this grade shall have the amount of color specified hereinafter for the variety. (See Tolerances and condition after storage or transit, p. 5.)

U. S. No. 1.—The requirements for this grade are the same as U. S. Fancy except that less color is required for all varieties except yellow and green

¹ This supersedes amendment no. 1 to Service and Regulatory Announcements No. 93 (B. A. E.), Revised.

varieties, for which the requirements for both grades are the same. Apples of this grade shall be of one variety, mature (1) but not overripe (2), carefully hand-picked (3), clean (4), fairly well formed (5); free from decay, internal browning, internal break-down, scald, freezing injury, broken skins and bruises (except those incident to proper handling and packing), and visible water core. The apples shall also be free from damage (7) caused by russetting (7a), sunburn (7b), spray burn (7b), limb rubs (7c), hail (7d), drought spot (7d), scars (7d), disease (7e), insects (7f), or mechanical or other means (7). Each apple of this grade shall have the amount of color specified hereinafter for the variety. (See Tolerances and condition after storage or transit, p. 5.)

U. S. Commercial shall consist of apples of one variety which meet the requirements of U. S. No. 1 except as to color. This grade is provided for apples which are mature but which do not have sufficient color to meet the specifications of U. S. No. 1. (See Tolerances and condition after storage or transit, p. 5.)

U. S. No. 1 Early shall consist of apples of one variety which meet the requirements of U. S. No. 1 except as to color and maturity. Apples of this grade may have no red color and need not be mature. This grade is provided for early varieties only, such as Oldenburg (Duchess of Oldenburg), Gravenstein, Lowland Raspberry (Liveland Raspberry), Red June, Summer Hagloe, Twenty Ounce, Wealthy, Williams, Bailey Sweet, Bietigheimer, and other varieties which ripen at the same period and which are often used for cooking rather than for eating out of hand. (See Tolerances and condition after storage or transit, p. 5.)

U. S. Utility shall consist of apples of one variety which are mature (1) but not overripe (2), carefully hand-picked (3), not seriously deformed (6); free from decay, internal browning, internal break-down, scald, and freezing injury. The apples shall also be free from serious damage (8) caused by dirt or other foreign matter, broken skins, bruises, russetting (8a), sunburn (8b), spray burn (8b), limb rubs (8c), hail (8d), drought spot (8d), scars (8d), visible water core (8e), disease (8f), insects (8g), or mechanical or other means (8). (See Tolerances and condition after storage or transit, p. 5.)

U. S. Utility Early shall consist of apples of one variety which meet the requirements of U. S. Utility except as to maturity. Apples of this grade need not be mature. This grade is provided for early varieties only, such as Oldenburg (Duchess of Oldenburg), Gravenstein, Lowland Raspberry (Liveland Raspberry), Red June, Summer Hagloe, Twenty Ounce, Wealthy, Williams, Bailey Sweet, Bietigheimer, and other varieties which ripen at the same period and which are often used for cooking rather than for eating out of hand. (See Tolerances and condition after storage or transit, p. 5.)

Combination grades.—Combinations of the above grades may also be used as follows:

- Combination U. S. Fancy and U. S. No. 1.
- Combination U. S. No. 1 and U. S. Commercial.
- Combination U. S. No. 1 and U. S. Utility.

Combinations other than these are not provided for in connection with the United States apple grades. When combination grades are packed, at least 50 percent of the apples in any container shall meet the requirements of the higher grade in the combination. (See Tolerances and condition after storage or transit, p. 5.)

U. S. Hail grade shall consist of apples which meet the requirements of U. S. No. 1 except that hail marks where the skin has not been broken and well-healed hail marks where the skin has been broken shall be permitted, provided the apples are fairly well formed. (See Tolerances and condition after storage or transit, p. 5.)

Unclassified shall consist of apples which are not graded in conformity with any of the foregoing grades.

COLOR

In addition to the foregoing requirements for U. S. Fancy and U. S. No. 1, each apple of these grades must have the percentage of color shown in table 1.

TABLE 1.—Percentage of red color required for apples of U. S. Fancy and U. S. No. 1 grades

Variety	U. S. Fancy	U. S. No. 1	Variety	U. S. Fancy	U. S. No. 1
Solid red:	<i>Percent</i>	<i>Percent</i>	Striped or partially red—Contd.	<i>Percent</i>	<i>Percent</i>
Aiken Red.....	50	25	Salome.....	33	15
Arkansas Black.....	50	25	Stayman Winesap.....	33	15
Black Ben.....	50	25	Sutton.....	33	15
Detroit Red.....	50	25	Tompkins King.....	33	15
Esopus Spitzenburg.....	50	25	Wagener.....	33	15
Gano.....	50	25	Wealthy.....	33	15
King David.....	50	25	Willowtwig.....	33	15
Lowry.....	50	25	York Imperial.....	33	15
Opalescent.....	50	25	Other similar varieties.....	33	15
Virginia Beauty.....	50	25	Stark.....	25	10
Winesap.....	50	25	Hubbardston.....	25	10
Other similar varieties.....	50	25	Other similar varieties.....	25	10
Striped or partially red:			Red June.....	33	(1)
Jonathan.....	50	25	Williams.....	33	(1)
Kinnard.....	50	25	Other similar varieties.....	33	(1)
McIntosh.....	50	25	Gravenstein.....	25	(1)
Missouri Pippin.....	50	25	Jefferies.....	25	(1)
Other similar varieties.....	50	25	Oldenburg (Duchess of Oldenburg).....	25	(1)
Arkansas (Mammoth Black Twig).....	33	15	Red Astrachan.....	25	(1)
Delicious.....	33	15	Shiawassee.....	25	(1)
Baldwin.....	33	15	Smokehouse.....	25	(1)
Gray Baldwin.....	33	15	Summer Rambo.....	25	(1)
Ben Davis.....	33	15	Twenty Ounce.....	25	(1)
Bonum.....	33	15	Other similar varieties.....	25	(1)
Fameuse.....	33	15	Red cheeked or blushed:		
Limburtwig.....	33	15	Hyde King.....	(2)	(3)
Nero.....	33	15	Maiden Blush.....	(2)	(3)
Northern Spy.....	33	15	Monmouth (Red Cheeked Pippin).....	(2)	(3)
Ontario.....	33	15	Winter Banana.....	(2)	(3)
Paragon.....	33	15	Other red cheeked or blushed varieties.....	(2)	(3)
Ralls (Geneton).....	33	15	Yellow or green varieties.....	(4)	(4)
Rainier.....	33	15			
Rome Beauty.....	33	15			

¹ Tinge of color.

² Blushed cheek.

³ None.

⁴ Characteristic color

For the solid red varieties the percentage stated refers to the area of the surface which must be covered with a good shade of solid red characteristic of the variety, except that an apple having color of a lighter shade of solid red or striped red than that considered as good shade of red characteristic of the variety may be admitted to a grade, provided it has sufficient additional area covered so that the apple has as good an appearance as one with the minimum percentage of good red characteristic of the variety required for the grade.

For the striped red varieties the percentage stated refers to the area of the surface in which the stripes of good shade of red characteristic of the variety shall predominate over the stripes of lighter red, green, or yellow. However, an apple having color of a lighter shade than that considered as good shade of red characteristic of the variety may be admitted to a grade, provided it has sufficient additional area covered so that the apple has as good an appearance as one with the minimum percentage of stripes of good red characteristic of the variety required for the grade. Faded brown stripes shall not be considered as color except in the case of the Gray Baldwin variety.

DEFINITIONS OF TERMS

As used in these grades:

1. "Mature" means having reached the stage of maturity which will insure the proper completion of the ripening process.

Before a mature apple becomes overripe it will show varying degrees of firmness, depending upon the stage of the ripening process. The following terms are used for describing these different stages of maturity of apples:

(a) "Hard" means apples with tenacious flesh and starchy flavor. Apples at this stage are suitable for storage and long-distance shipment.

(b) "Firm" means apples with tenacious flesh but becoming crisp with a slight starchy flavor, except the Delicious variety. Apples at this stage are also suitable for storage and long-distance shipment.

(c) "Firm ripe" means with crisp flesh except that in apples of the Gano, Ben Davis, and Rome Beauty varieties the flesh may be slightly mealy. Apples at this stage may be shipped long distances but should be moved into consumption within a short period of time.

(d) "Ripe" means mealy and soon to become soft for the variety. Apples at this stage should be moved immediately into consumption.

2. "Overripe" means dead ripe, very mealy or soft, past commercial utility.

3. "Carefully hand-picked" means that the apples do not show evidence of rough handling or of having been on the ground.

4. "Clean" means free from excessive dirt, dust, spray residue, or other foreign material.

5. "Fairly well formed" means that the apples may be slightly abnormal in shape but not to an extent which detracts materially from the appearance of the fruit.

6. "Seriously deformed" means so badly misshapen that the appearance is severely affected.

7. "Damage" means any injury or defect which materially detracts from the appearance or keeping quality of the apples.

(a) Russetting which exceeds the following shall be considered as damage:

Russetting which is excessively rough on Roxbury Russet and other similar varieties.

Russetting on other varieties which covers a total area of more than 25 percent of the surface in the aggregate except that—

(1) Smooth, solid russetting which covers an area of more than 10 percent of the surface in the aggregate shall be considered as damage unless the russetting is within or continuous with that in the stem basin or calyx cavity, in which case an additional 15 percent shall be permitted provided that the total area covered shall not exceed 25 percent in the aggregate.

(2) Slightly rough russetting which covers an area of more than 15 percent of the surface if confined to the stem basin or calyx cavity or continuous therewith, or such russetting which covers an area of more than one-half inch in diameter if it is not continuous with the russetting in the stem basin or calyx cavity, shall be considered as damage.

(3) Rough russetting which is well within the stem basin and is not readily apparent shall be permitted, but any other rough russetting which exceeds one-quarter inch in diameter shall be considered as "damage."

Any one of the following defects, or any combination thereof, the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as damage:

(b) Sunburn or spray burn which has caused blistering or cracking of the skin or when the discolored area does not blend into the normal color of the fruit unless the injury can be classed as russetting (7a).

(c) Dark-brown or black limb rubs which affect a total area of more than one-half inch in diameter or light-brown limb rubs which affect a total area of more than 1 inch in diameter.

(d) Hail marks, drought spots, or other similar depressions or scars which are not superficial or where the injury affects more than one-half inch of the surface in the aggregate.

(e) Disease. Scab spots which are not corked over or corked-over scab spots which affect a total area of more than one-fourth inch in diameter.

Cedar-rust infection which exceeds in the aggregate an area of one-quarter inch in diameter.

Sooty blotch or fly speck which is thinly scattered over more than one-tenth of the surface, or dark, heavily concentrated spots which affect an area of more than one-half inch in diameter.

(f) Insects. More than two healed insect stings or any healed insect sting which is over one-eighth inch in diameter exclusive of any encircling discolored ring.

Worm holes.

8. "Serious damage" means any injury or defect which seriously detracts from the appearance or keeping quality of the apples.

(a) Russetting which exceeds the following shall be considered as serious damage:

Smooth solid russetting which affects more than one-half of the surface in the aggregate, including any russetting in the stem basin, or rough or bark-like russetting which detracts from the appearance of the fruit to a greater extent than the smooth solid russetting permitted provided that any amount of russetting shall be permitted on Roxbury Russet and similar varieties.

Any one of the following defects or any combination thereof, the seriousness of which exceeds the maximum allowed for any one defect shall be considered as serious damage:

(b) Sunburn or spray burn which seriously detracts from the appearance of the fruit.

(c) Limb rubs which affect more than one-tenth of the surface in the aggregate.

(d) Hail marks, drought spots, or scars, if they materially deform or disfigure the fruit, or if such defects affect more than one-tenth of the surface in the aggregate, provided that no hail marks which are unhealed shall be permitted and not more than an aggregate area of one-half inch shall be allowed for well-healed hail marks where the skin has been broken.

(e) Visible water core which affects an area of more than one-half inch in diameter.

(f) Disease.

Scab spots which are not corked over or corked-over scab spots which affect a total area of more than three-fourths inch in diameter.

Cedar-rust infection which exceeds in the aggregate an area of three-fourths inch in diameter.

Sooty blotch or fly speck which affects more than one-third of the surface.

(g) Insects.

More than five healed insect stings.

Worm holes.

TOLERANCES FOR PRECEDING GRADES

In order to allow for variations incident to proper grading and handling, not more than a total of 10 percent of the apples in any container may be below the requirements of the grade, provided that not more than 5 percent shall be seriously damaged by insects and not more than one-fifth of this amount, or 1 percent, shall be allowed for decay or internal break-down.

When applying the foregoing tolerances to the combination grades no part of any tolerance shall be allowed to reduce, for the lot as a whole, the 50 percent of apples of the higher grade required in the combination, but individual containers may not have less than 40 percent of the higher grade.

The tolerances for the standards are on a container basis. However, individual packages in any lot may vary from the specified tolerances as stated below, provided the averages for the entire lot, based on sample inspection, are within the tolerances specified.

For a tolerance of 10 percent or more, individual packages in any lot may contain not more than one and one-half times the tolerance specified, except that when the package contains 15 specimens or less, individual packages may contain not more than double the tolerance specified.

For a tolerance of less than 10 percent, individual packages in any lot may contain not more than double the tolerance specified, provided at least one specimen which does not meet the requirements shall be allowed in any one package.

CONDITION AFTER STORAGE OR TRANSIT

Decay, scald, or other deterioration which may have developed on apples after they have been in storage or transit shall be considered as affecting condition and not the grade.

SIZE REQUIREMENTS

The numerical count or the minimum size of the apples packed in a closed container shall be indicated on the package.

When the numerical count is marked on the container the apples shall not vary more than one-fourth inch in their transverse diameter.

When the numerical count is not shown the minimum size shall be plainly stamped, stenciled, or otherwise marked on the container in terms of whole inches, whole and half inches, whole and quarter inches, or whole and eighth inches, as $2\frac{1}{2}$ inches minimum, $2\frac{1}{4}$ inches minimum, or $2\frac{3}{8}$ inches minimum, in accordance with the facts. It is suggested that both minimum and maximum sizes be marked on the container, as $2\frac{1}{4}$ to $2\frac{3}{4}$ inches, or $2\frac{1}{2}$ to $2\frac{3}{4}$ inches, as such marking is especially desirable for apples marketed in the export trade.

"Size" means the transverse diameter of the apples taken at right angles to a line running from the stem to the blossom end.

In order to allow for variations incident to proper sizing, not more than 5 percent of the apples in any container may not meet the size requirements, provided that when the maximum and minimum sizes are both stated an additional 10-percent tolerance is provided for apples which are larger than the maximum size stated.

PACKING REQUIREMENTS

Each package shall be packed so that the apples in the shown face shall be reasonably representative in size, color, and quality of the contents of the package.

Boxes.—Apples packed in the standard northwestern apple boxes shall be arranged in the containers according to the approved and recognized methods with the stems pointing toward the ends of the boxes, except when jumbled, and all packages shall be well filled but the contents shall not show excessive or unnecessary bruising because of overfilled packages. Apples packed in the standard northwestern apple boxes shall show a total bulge (top and bottom) of not less than three-fourths inch. Each wrapped apple shall be completely enclosed by its individual wrapper.

Baskets.—Apples packed in round-stave bushel baskets or tubs shall be ring faced and tightly packed with sufficient bulge to prevent any appreciable movement of the apples within the containers when lidded.

Barrels.—Apples in barrels shall be tightly packed.

In order to allow for variations incident to proper packing not more than 5 percent of the containers in any lot may not meet these requirements.

MARKING

In order to conserve space, abbreviations may be used for marking the United States grade names on containers. The following abbreviations are suggested where it is not desired to use the full grade name:

1. U. S. Fcy. for U. S. Fancy.
2. U. S. No. 1 for U. S. Number 1.
3. U. S. Com. for U. S. Commercial.
4. U. S. Util. for U. S. Utility.
5. Combination grades may be designated by abbreviations of the grades preceded by the abbreviation "Comb." as "Comb. U. S. Fcy.—U. S. No. 1."

STANDARDS FOR EXPORT

As applied to condition factors:

1. The apples in any lot shall be generally tightly packed when in barrels or baskets and either generally fairly tight or tightly packed when in boxes.
2. Not more than 5 percent of the apples in any container shall be further advanced in maturity than firm ripe.
3. Not more than a total of 5 percent of the apples in any container shall be damaged by bitter pit, Jonathan spot, scald, internal break-down, water core, freezing, decay, or other such condition factors, except that—
 - (a) Not more than 2 percent shall be allowed for apples affected by decay.

(b) Not more than 2 percent shall be allowed for damage by internal breakdown.

(c) The apples shall be free from scald unless they are properly packed in oiled paper or have been especially treated with oil to prevent scald. When so packed or treated, not more than 2 percent of slight scald shall be permitted.

Any lot of apples shall be considered as meeting the standards for export if the entire lot averages within the requirements specified, provided that no sample from the containers in any lot is found to exceed double the percentages specified.



In testimony whereof I have hereunto set my hand and caused the official seal of the Department of Agriculture to be affixed, in the City of Washington, this 26th day of August 1937.

H Wallace

Secretary of Agriculture.

A STATEMENT RELATIVE TO THE UNITED STATES APPLE STANDARDS

The adoption and use of standardized grades in transactions in farm produce has eliminated much of the source of misunderstanding and dissatisfaction. Clearcut grades based on variations in quality, provide a practicable basis for contracts and purchases upon which buyers and sellers can deal with mutual confidence and understanding.

In addition to the designation "Unclassified", 10 grades have been provided as follows: U. S. Fancy; U. S. No. 1; U. S. No. 1 Early; U. S. Commercial; U. S. Utility; U. S. Utility Early; Combination U. S. Fancy and U. S. No. 1; Combination U. S. No. 1 and U. S. Commercial; Combination U. S. No. 1 and U. S. Utility; U. S. Hail grade.

U. S. Fancy grade is intended for well-colored apples for which a premium is usually secured.

U. S. No. 1 is provided for apples which meet the requirements of U. S. Fancy, except that less color is required.

U. S. No. 1 Early is provided for early varieties which may have no red color and which may not be mature, but which meet all other requirements for U. S. No. 1 grade. Such apples are often used for cooking purposes rather than for eating out of hand.

U. S. Commercial is provided for apples which meet the requirements of U. S. No. 1 except for color. Apples of this grade must be mature.

U. S. Utility is provided for apples which are free from serious damage from any cause. During light-crop years this grade of apples may be utilized and shipped to advantage, but during years of heavy production it is best to send such stock to byproducts plants or to local markets.

U. S. Utility Early is provided for early varieties which may not be mature but which meet all other requirements for U. S. Utility grade.

Combination grades are provided to care for many lots of apples which in the past have been marked "Commercial" or "Unclassified", although such lots may have contained a large percentage of high-quality apples. It is expected that the use of combination grades will reduce the quantity of stock shipped at the present time under the Commercial grade or the Unclassified designation.

STATEMENT OF CONDITION

Attention is called to the statement that scald, decay, or other such deterioration which may have developed on apples after they have been in storage or transit shall be considered as affecting the condition and not the grade. When ordering apples which have been held in storage it is advisable to secure, in addition to the grade statement, information relative to the maturity and relative to the freedom from scald or decay or the percentages of scald or decay which may be in the particular lot in question.

STANDARDS FOR EXPORT

As applied to condition factors.

United States standards for export have been provided with a view to establishing a common language between exporters and the foreign buyers as to the condition of the apples at the time of inspection. It must be understood,

however, that such factors as the previous handling and storage (as they affect keeping quality) or the temperature and length of time in transit may cause a change in the condition of the apples after they have been inspected. The tightness of pack may also be affected by decay or softening in transit.

Official certificates issued on requests for certification for export will bear the statement "Lot meets United States standards for export", provided the apples meet these standards. An inspection certificate which bears this statement will show that the lot of apples so described meets the United States standards for export at the time of inspection. It means that such apples were generally tightly packed when in barrels or baskets and were either generally fairly tight or tightly packed when in boxes and not more than 5 percent were further advanced in maturity than firm ripe. It also means that not more than a total of 5 percent of the apples were damaged by bitter pit, Jonathan spot, scald, internal break-down, water core, freezing, decay, or other such condition factors, except that not more than 2 percent were affected by decay and not more than 2 percent damaged by internal break-down and that the apples were free from scald except that when properly packed in oiled paper or especially treated with oil to prevent scald, not more than 2 percent were affected with slight scald.

Although apples may be certified as meeting the export standards, such a statement on the certificate does not assure the buyer that the apples will arrive at destination in a satisfactory condition. Uncertainty as to such factors as time in transit, temperature, and ventilation in stowage, makes it manifestly impossible to forecast accurately the condition of such fruit on arrival at destination. Official certification merely describes its condition at the time of the inspection.

PACKING REQUIREMENTS

The United States standards specify that the "apples in the shown face shall be reasonably representative in size, color, and quality of the contents of the package."

It has long been the practice in the barreled-apple region to place the best apples in the shown face, and the custom has often been carried to extremes. The United States standard for packing is provided to discourage such extreme overfacing, which has been the cause of much dissatisfaction to buyers in both the domestic and foreign trade.

The apples used for facing should not be so different from the remainder of the apples as to cause a marked contrast. This applies to size as well as to the color and other quality factors. When 3-inch apples are used to face containers which contain mostly $2\frac{1}{4}$ - to $2\frac{1}{2}$ -inch fruit the contrast is so great that the $2\frac{1}{4}$ -inch apples appear smaller than they really are, with consequent complaints. Similar objections frequently are made to containers which are faced with $2\frac{1}{2}$ -inch apples but which contain many 3-inch or larger apples in the middle of the barrel.

Most European markets prefer to have the range of sizes marked upon barrels and baskets. Certain outlets desire medium or small sizes, whereas certain others prefer large sizes for cooking purposes.

It is suggested that the barrels and baskets should be marked with both the minimum and maximum sizes, especially when they are intended for export. Such marking of barrels as " $2\frac{1}{4}$ to $2\frac{3}{4}$ inches" or other range of size which properly describes the fruit is far more definite than the statement of minimum size only.

BRUISING

Apples are often unnecessarily bruised by careless picking or by improper packing methods. Such bruises are not always evident at the time of packing, but they may become very pronounced several days later, and when the barrels are opened for display the apples may present an unattractive appearance.

Adequate racking of the barrels on a solid foundation during the period of filling is very important in preventing slack barrels. Many packers attempt to make tight packs through heavy pressing instead of through frequent vigorous racking prior to pressing. Apples which are bruised by pressing tend to become soft, or to decay in storage or transit, so that overpressing often causes more slack barrels at destination than would occur if proper racking and pressing were practiced.